

# 3D bioprinted Rhabdosphincter for reverting Stress Urinary Incontinence

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## INTRODUCTION

Urinary Incontinence (UI) is a clinical condition, but not a disease, itself, affecting over 400 million people worldwide [1]. A functional Rhabdosphincter (RS) is essential for maintaining urinary continence in both males and females. The RS may be damaged due to several factors such as childbirth, obesity, age, surgical interventions, etc.; and thus, may render a person incontinent [2].

Intraurethral and periurethral injections of cellular therapies have shown to be promising in animal and clinical studies but, nevertheless, these also have their limitations due to scarring of the skeletal muscle tissue comprising the RS which leads to an inadequate blood supply and denervation of the pudendal nerve (PN) [3] - [5]. At the Autonomous University of Nuevo Leon (UANL) in Monterrey, Mexico, the Urology department, alongside the Hematology department are putting efforts in the development of 3D bioprinted cellularized constructs of the RS using the BIO-X by CELLINK, for implantation in patients that have lost function of their RS in attempts to revert the condition of SUI and rendering them continent, once again.

## MATERIALS AND METHODS

- The bioprinter being used for the project: BIO-X by CELLINK.
- Cells to be used in the project: ADMSCs and AMDCs
- Bioinks included in the project: Bio Conductink; GelMA Fibrin; GelXA Laminink 121, & GelXA Laminink 521.

## RESULTS AND DISCUSSION

Results are yet to be attained, as the supporting materials are in process of being purchased. Once successful in-vitro culturing of the cellularized scaffold results in a promising vascularized constructs with focal points that will render proper innervation, fresh constructs will be made utilizing autologous cells from the animal test subjects that will be part of the pre-clinical trial to print a viable animal RS for subsequent implantation.

## CONCLUSIONS

Since this study is in its early developmental stages, it is still inconclusive.

## ETHICAL STATEMENTS

This project is under revision by the Committee of Ethics of the UANL to ensure that all the appropriate protocols of animal handling, and veterinary care are diligently followed.

## REFERENCES

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